OHIO'S ENGINEERING FIRSTS

By GEORGE S. BONN

3. THE AUTOMOBILE

EVEN though Charles E. Duryea made the first American gasoline automobile that actually ran, it was an Ohio motor car company that made the first actual sale of an automobile. Even though Elwood Haynes built the first American automobile that departed from the "horseless carriage" form, an Ohio company ran the first American automobile ad in any national magazine. The first reliability run, the first demonstration, the first 8-cylinder engine, and the first gasoline commercial vehicle produced on a commercial scale were all made by this same company, The Winton Motor Carriage Co. of Cleveland.

The first man to produce 10,000 cars a year and to manufacture pressed steel parts for cars was an Ohio man. The inventor of the self starter and ignition system was an Ohio (and Ohio State University) man. The first city in the country to use a gasoline auto for mail collection was Cleveland. The first city to use a gasoline auto for a patrol wagon was Akron. The pioneer tire manufacturer in the United States was, and still is, in Akron. The first concrete road in the country was laid in Bellefontaine. The first concrete bridge in the country was built in Cincinnati. Ohio had plenty of automobile firsts.

Alexander Winton

Alexander Winton, a most uncanny Scot, was born at Grangemouth, Scotland, in 1860. At 20, he came to America and, after four years in New York, he moved to Cleveland where he set up a bicycle business in 1884. He made a number of inventions for the bicycle but his interest in motor cars caused The Winton Bicycle Co. to become The Winton Motor Carriage Co. in May, 1897. The distinctive feature about this car was Winton's own invention of a pneumatic governor that regulated the amount of mixed gas and air taken into the cylinder as well as the amount of gasoline to give the right quantity of gas.[1]

Other experimenters had been monkeying around with gasoline automobiles for several years. Records show that in 1892 Charles E. Duryea built in New England the first American gasoline automobile that actually ran; it was not, however, a howling success. Then in 1893 up in Michigan Henry Ford brought out the second gasoline car that would run; he has since built others. The following year, 1894, over in Indiana, Elwood Haynes, metallurgist, discoverer, inventor, built the third runnable American car; this was the first to break away from the "horseless carriage" form. In 1895 George B. Selden was granted the first American car patent which, incidentally, had been filed several years earlier; in 1911 all kinds of trouble arose over the interpretation of that patent.

Anyway, according to James Doolittle[2], in 1896 there were four gasoline automobiles in America, those of Duryea, Ford, and Haynes and an imported Benz, all of which were purely experimental. While efforts were made to sell duplicates, there was no market.

The very first bona fide sale was made March 24, 1898, when, as Doolittle puts it, "Alexander Winton sold a one-cylinder Winton automobile to Robert Allison of Port Carbon, Pa., and received payment for it and shipped the car to Allison April 1." Winton had been building four cars for sale, but there were no buyers until this Robert Allison, a mechanical engineer by the way, came to Cleveland expressly to buy a car; why he did, we don't know. He called at the Winton works and was shown the completed car and the three still abuilding. He asked for a ride and got it; he was driven around the city on the first "demonstration" ever made to sell an automobile. The trip must have convinced him because when they returned to the plant he bought the car and paid for it. It was delivered to him a week later. Allison ran the car for two years and, at Winton's re-

[1] *National Cyclopedia of American Biography.* Vol. XII. James T. White & Co., New York, 1904.

[2] James Rood Doolittle, editor. *The Romance of the Automobile Industry.* The Klebold Press, New York, 1916.

FIRST AUTOMOBILE AD IN A NATIONAL MAGAZINE

Scientific American, July 30, 1898

DISPENSE WITH A HORSE

and save the expense, care and anxiety of keeping it. To run a motor carriage costs about ½ cent a mile.

THE WINTON MOTOR CARRIAGE

is the best vehicle of its kind that is made. It is handsomely, strongly and yet lightly constructed and elegantly finished. Easily managed. Speed from 3 to 20 miles an hour. The hydrocarbon motor is simple and powerful. No odor, no vibration. Suspension Wire Wheels. Pneumatic Tires. Ball Bearings. ☞ *Send for Catalogue.*

Price $1,000. *No Agents.*

THE WINTON MOTOR CARRIAGE CO., Cleveland, Ohio.

RANDOM PRICES OF OHIO-MADE AUTOMOBILES DURING THE PAST 30 YEARS, UP TO 1921*

Year	*Make*	*Where Made*	*Cyl.*	*Price*
1908	Stearns 15-30 h. p. touring	Cleveland	6	$3200
1908	Stearns 30-60 h. p. touring	Cleveland	6	4600
1908	Stearns 30-60 h. p. limousine	Cleveland	6	5750
1912	Stearns-Knight	Cleveland	4	3500
1912	Winton	Cleveland	6	3000
1912	Peerless	Cleveland	4	4300
1912	Overland	Toledo	4	850
1913	Chandler	Cleveland	6	1785
1913	Allen	Columbus	4	1385
1913	Republic	Hamilton	4	2250
1914	Grant	Cleveland	4	495
1914	Willys-Knight	Toledo	4	2850
1914	Westcott	Springfield	4	1385
1914	Arbenz	Chillicothe	4	675
1916	Monitor	Columbus	4	985
1916	Vogue	Tiffin	4	1040
1917	Jordan	Cleveland	6	1650
1917	Owen-Magnetic	Cleveland	6	3300
1917	Maibohm	Sandusky	4	830
1917	Seneca	Fostoria	4	735
1918	Templar	Cleveland	4	2185
1919	Holmes	Canton	6	2900
1920	Carroll	Lorain	6	3985
1920	Cleveland	Cleveland	6	1485
1920	Washington	Eaton	6	1685

* From *Chilton Automobile Directory*, 1921; the 1908 Stearns prices are from an ad in the *Christian Science Monitor* (Boston) for November 25, 1908; the 1913 Republic price is from an ad in the Cincinnati *Enquirer* for June 22, 1913.

quest, sold it back to The Winton Motor Carriage Co. where it was kept in good running order for a number of years.

That same year, 1898, saw the appearance of the first gasoline commercial vehicle to be produced on a commercial scale in the United States, the Winston delivery wagon. It was simply a panel body mounted on a regular pleasure car chassis driven by a 6 h. p. single cylinder engine.

The First Ad

Alexander Winton apparently believed in getting his product before the public before his competitors. He was the first automobile manufacturer to advertise in any nationally distributed magazine. The first ad with its advice to DISPENSE WITH A HORSE appeared in *Scientific American* for July 30, 1898; it is here reproduced through the courtesy of the magazine. This was not only the first ad, but it was the beginning of the first advertising campaign; a Winton Motor Carriage Co. ad appeared each week in *Scientific American,* 14 different ones appearing before the end of 1898.

Not content with just magazine advertising, Winton put on "reliability" runs to New York to educate the public that his cars had stamina, among other things. The very first of these was made in the spring of 1897 and it was a slow, hard trip; about all Winton stirred up was a little curiosity. However, he took a newspaper man with him the next time. They left Cleveland May 22, 1899, and got to New York in 47½ hours running time, traveling over 700 miles at an average speed of 4:02 minutes per mile. The reporter wrote daily accounts of the trip for the newspapers and succeeded in stirring up not curiosity but real interest. They were greeted royally in every town they went through. These first efforts at intelligent publicity had their effects, for the ordinary public began buying the cars after this; the earlier sales had been mostly to engineers who wanted to tinker with the cars.

Cleveland became interested and tried out a Winton auto for its mail collection. Akron became interested and had its fire department build a gasoline auto patrol wagon which was a great success; Frank Loomis, the department engineer, designed it.

The Winton was the first car to come out with eight cylinders; as a matter of interest, Cadillac came out with the first American *V-8* in 1914, while Packard brought out the first twin-six, 12 cylinders, in 1915. The Winton was also the only American entry in the early Bennett Cup races though it seldom came in first. These early races were held in Europe because it wasn't until 1909-1910 that the first American speedway was built, incidentally in Indianapolis, Ind.

10,000 Cars a Year

Because Walter E. Flanders could produce 1000 crankshafts to order for Henry Ford, this small Ohio town machinist got all of Ford's crankshaft business. Since Flanders could mass-produce crankshafts perhaps he could do the same with automobiles, so Ford hired him to find out. Under Flanders the Ford plant fulfilled its founder's grandest (at that time) dream, the pro-

DO YOU KNOW ANY OF THESE?

MOTOR CARS MADE IN OHIO DURING FIRST 25 YEARS OF "AUTO AGE," 1897-1921*

Allen, Arbenz, Baker, Ben-Hur, Bimel, Carroll, Chandler, Cino, Cleveland, Columbus Electric, Cyclomobile, Disbrow, Eagle-Macomer, Economy, Enger, Erie,

Firestone Columbus, Ferris, Fostoria, Fremont, Garford, Globe, Grant, Halliday, H.A.R., Holmes, Houghton, Jewell, Jordan, Kelly, Kurtz, Logan,

Maibohm, Merit, Meteor, Milburn, Monitor, Ohio, Overland, Owen-Magnetic, Peerless, Pilliod, Rauch & Lang, Republic, Reya, Riddle, Richard,

Sandusky, Sayers & Scovill, Seneca, Spencer, Stearns, Stearns-Knight, Schacht, Templar, Vogue, Vulcan, Washington, Westcott, White, Willys-Knight, Winton.

* From *Chilton Automobile Directory, Dyke's Encyclopedia* for 1916, and *Romance of Automobile Industry.*

duction of 10,000 cars a year. That was around 1910. Two years later there appeared on the market the Flanders 20, product of the newly organized E. M. F. Co. which had been formed by three ambitious men, Everitt, Metzger, and Flanders. Using Flanders' ideas this company was the first to manufacture pressed steel parts for automobiles. The company prospered and brought forth many cars including the E. M. F. 30 in 1920 before it finally was taken over by Studebaker.

Then there was Hugh Chalmers, the Dayton, Ohio, boy, whose car set a most remarkable sales record. At a dealers' convention in Detroit in November, 1915, salesmen sold $22,000,000 worth of Chalmers cars in just 40 minutes! Chalmers, born in Dayton in 1873, became vice president and general manager of the National Cash Register Co. at the age of 27. In 1907 he became president of the newly organized Chalmers-Detroit Co. which in 1908 became the Chalmers Motor Co. In 1922 the company was sold to the Maxwell Co. which a few years later became the Chrysler Motor Corp.

In the U. S. Patent Office *Official Gazette* for February 8, 1916, is the following entry:

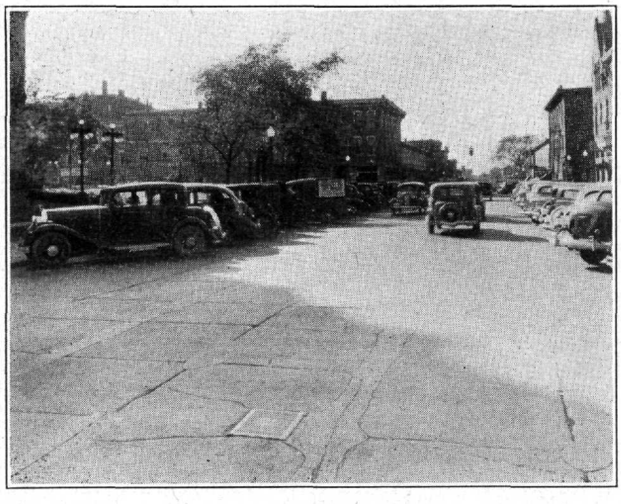
1,171,055. Engine Starting, Lighting, and Ignition System. Charles F. Kettering, Dayton, Ohio, assignor to The Dayton Engineering Laboratories Co., a Corporation of Ohio. Filed April 17, 1911.

Then follows a page and a half of choice legal language explaining the "system" and telling how it works. The accomplishments of Charles F. Kettering, born near Loudonville, Ohio, in 1876 and graduated from Ohio State in 1904, and well known through their applications. The man, "Boss Ket" of General Motors' research labs and treasurer of The Ohio State University, is also well known through the numerous books and magazine articles written about him. The invention of the automobile self starter and ignition system was just one of the accomplishments of the man, but it practically revolutionized the automobile industry.

COLUMBUS STREET, BELLEFONTAINE, OHIO

PART OF FIRST CONCRETE PAVEMENT, LAID 1893

Photo by Portland Cement Association.



First Concrete Streets

The construction of the first concrete pavement in the United States occurred almost accidentally. A lumber company in Bellefontaine, Ohio, asked the city engineer, J. C. Wonders, to make a crossing driveway that would stand up under the heavy loads of lumber and coal hauled and the hoofs of the heavy horses doing the

AUTOMOBILE COMPANIES ORGANIZED DURING FIRST HALF OF MOTOR-CAR AGE, 1897-1916*

How many do you recognize?

1897—Autocar

1898—Adams-Farwell, Stanley Brothers, Stearns, Thomas, Matheson, Waverly, Winton, Haynes-Apperson

1899—Baker Electric, Locomobile, R. E. Olds, Pierce-Racine

1900—Austin, Babcock, Elmore, Glide, Jackson, Knox, Lane, Lambert, National Electric, Packard, Peerless

1901—Acme (S. G. V.), Gaeth, Pierce-Arrow, White, Royal Tourist, Stevens-Duryea, Waltham-Orient, Pope-Toledo, Welch, Pullman, Rambler (Jeffery)

1902—Cadillac, Franklin, Pope, Studebaker (in wagon business for 50 years), Okey, Sultan, Walter, Schacht

1903—Ford, Auburn, Bergdall, Holsman, Columbus, Chadwick, Moline, Overland, Corbin, Premier.

1904—Buick, Cleveland, American, Napier, Stoddard-Dayton, Mitchell, Jewell, McIntyre, Marmon, Pittsburgh Electric, Rauch and Lang, Simplex

1905—Alco, American, Dorris, Johnson, Jonz, Kisselkar, Maxwell, Monarch, Reo, Studebaker-Garford, American-Mors

1906—Anderson Electric, A.B.C., Cartercar, Brunn, Thomas-Detroit, Kearns, Sterling, Mora, Moon, Pennsylvania, Palmer and Singer, Staver

1907—Albany, Atlas, Brush, Bertolet, Byrider, Carter, Chalmers, Coppock, De Luxe, Oakland, Regal, Selden, Speedwell, Interstate, Great Western, Lozier

1908—Sharp-Arrow, Pittsburgh 6, Crown, Midland, Rider-Lewis, Paige-Detroit, Velie, Cole, E.M.F., Hupmobile, Stearns-Knight

1909—Hudson, Advance, Cunningham, Coates-Goshen, Ohio, Abbott, and several others

1910—Halladay, among others

1911—Stutz, Republic, and others

1912—Chevrolet, particularly

1913—Scripps-Booth, Saxon, Chandler, Grant, Allen, Vulcan, et al.

1914—Dodge, Dort, Arbenz, Enger, to mention a few

1915—Owen-Magnetic, Meteor, etc.

1916—Monitor, Vogue, Bimel, H.A.L., Nash, Pilliod, Richard, etc.

* From *The Romance of the Automobile Industry* and the *Chilton Automobile Directory.*

hauling. A local contractor, W. T. G. Snyder, put in a concrete pavement which worked so well that it attracted the attention of the city officials who asked Mr. Snyder to put in some street work.[3]

That was in the early part of 1892. Before the end of 1892 the two narrow streets, Opera and Court, on two adjoining sides of the Logan County courthouse square, had been paved. The 6-in. pavement was laid in 5½-ft. strips, marked off in blocks by inserting tar paper every five feet or so. The two wider streets, Columbus and Main, on the other sides of the court house, were paved in October and November of 1893, but the construction practices were about the same. All in all, there are about 7700 square yards in the pavement and the contract price was $2.15 per square yard. Engineers from all over the country came to see this remarkable piece of work. In 1926 a test specimen of the pavement failed uniformly under a load of 5400 pounds per square inch; really not bad.

First Concrete Bridge

In Eden Park, Cincinnati, is a concrete arch highway bridge built in 1894 by the L. Eid Construction Co. As H. H. Kranz, engineer of highways for the city of Cincinnati, puts it, "The claim has often been made that this is the first bridge of this type to have been built in this country, and we have yet to hear a refutation."

Charles Evan Fowler in his *The Ideals of Engineering Architecture* has this to say about the bridge's architectural design:

"The ring is neatly accentuated by the moldings, the ornamental keystone, and still further by paneled spandrel walls. . . . The abutments are well designed and well proportioned. . . . The highly ornate design of the balustrade is very pleasing for a purely ornamental structure, and the details are exceedingly well proportioned.

"The span of the arch is 70 ft., the rise 10 ft., and the total width of the bridge 32.5 ft. The roadway is 18 ft. in width and the sidewalks 5 ft. each. The arch is 15 in. thick at the crown and 48 in. at the spring, reinforced with 9-in. 21-lb. I-beams, spaced 36 in. apart."

From the *Annual Report of the Park Department* of Cincinnati for 1895 we learn that the bridge was designed by Fr. von Emperger, an Austrian engineer, and constructed by the Melan Arch Construction Co. of New York. The lower flanges of the I-beams are at least two inches from the soffit of the arch.

"The concrete was made of dry mixed mortar and broken stone and the smallest possible amount of water. . . . This concrete was laid in layers of six inches and well tamped in place, entirely enclosing the steel ribs. The face of the arch and wing walls consists of a four-inch layer of cement mortar. . . . The top is paved with asphalt, and has a cement curb and sidewalk.

"The moulding, railing, coping and ornamental pieces were cast separately, and placed in their proper positions afterwards. The arch itself springs from abutments 7x28 feet, made of concrete laid on solid rock foundation . . . . A pilaster arises from the abutments at each side of the four corners with ornamented sides, and a square top on which rests an oval-shaped vase made of concrete. The arch was tested by running a fifteen-ton steam roller over it before the top was paved."

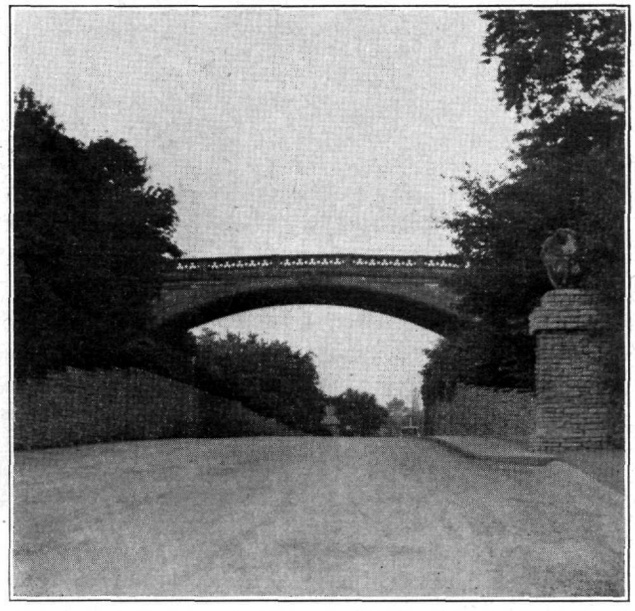


Photo by Arthur A. Wuest.

FIRST CONCRETE ARCH BRIDGE

BUILT 1894 IN EDEN PARK, CINCINNATI

(What if the arch had failed when the steam roller went over it? Just think what a mess!)

"It is practically a monolith; and although there are some minor defects in construction, yet as an entirely new departure in work of this kind it serves the purpose admirably, and has been favorably reported on by several engineers of note."

Mr. Kranz tells us that the four stone eagles on top of, and at the ends of, the retaining walls which flank the sides of the roadway underneath (U. S. 50) were placed there in 1912, when the Chamber of Commerce Building at Fourth and Vine Streets, the eagles' former roost, was destroyed by fire.

Incidentally, the drive over the top of the bridge leads from the old Eden Park water tower, a familiar Cincinnati land mark, to the rather recently dedicated (1929) monument commemorating the completion of the canalization of the Ohio River.

* * *

One out of every five people in this country has an automobile. Ohio has ranked second only to Michigan in the production of these cars. In 1895 there were only three cars running in America. Twenty years later, in 1915, there were 319 different kinds running. Now there are just eleven corporations producing about thirty different makes. Ohio's automobile business grew from $145,000 in 1899 to $250,000,000 in 1929. Ohio has had a lot to do with the development of the country's greatest manufacturing industry.

[3]From a reprint of an article in *Roads and Streets,* April, 1932.